

WHAT IS CLAIMED IS:

1 1. A method for maintaining data on a plurality of source code files,
2 comprising:
3 (a) generating a data store, for each source code file and for each program
4 statement in the source code file, by:
5 (i) generating information on the program statement; and
6 (ii) generating information on each program artifact referenced as an input
7 parameter in the program statement;
8 (ii) generating information on each program artifact referenced as an
9 output parameter in the program statement; and
10 (b) using the data store to determine program artifacts throughout all of the source
11 code files capable of being affected by any one program statement in any of the source
12 code files.

1 2. The method of claim 1, wherein the source code files comprise
2 components of an application program, wherein the data store indicates program artifacts
3 in source code files of application programs.

1 3. The method of claim 1, wherein generating information on the program
2 statements and program artifacts comprises:
3 associating each program artifact with a program statement referencing the
4 program artifact as one input or output parameter and information indicating whether the
5 program statement references the program artifact as input or output.

1 4. The method of claim 3, wherein the program artifact comprises a variable,
2 Input/Output buffer or file.

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1 5. A method for performing an impact analysis of program statements in a
2 source code file that is one of a plurality of source code files, wherein each program
3 statement has at least one of an input parameter and output parameter, comprising:

4 receiving selection of at least one program statement in one source code file; and
5 for each selected program statement, determining program statements throughout
6 the source code files having as one input parameter one program artifact that is affected
7 by the selected program statement.

1 6. The method of claim 5, wherein the source code files including the
2 program artifacts affected by the selected program statement comprise components of an
3 application program.

1 7. The method of claim 5, wherein determining the program statements
2 having as one input parameter one program artifact affected by the selected program
3 statement further comprises:

4 determining program statements in the source code files having as one input
5 parameter the program artifact that is one output parameter to the selected program
6 statement.

1 8. The method of claim 7, wherein determining the program statements
2 having as one input parameter one program artifact affected by the selected program
3 statement further comprises:

4 for each previously determined program statement having as one input parameter
5 one program artifact affected by the selected program statement, performing the steps of:
6 (i) determining the output parameter program artifact of the statement; and
7 (ii) determining program statements in the source code files having as one
8 input parameter the program artifact that is the output parameter of the previously
9 determined statement.

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1 9. The method of claim 8, wherein determining the program statements
2 having as one input parameter one program artifact affected by the selected program
3 statement further comprises:

4 for each previously determined program statement having as one input parameter
5 one program artifact that is the output parameter of one previously determined program
6 statement having as one input parameter one program statement affected directly or
7 indirectly by the selected source program statement, performing the steps of :
8

8 (i) determining the output parameter program artifact of the determined
9 program statement;

10 (ii) determining program statements in the source code files having as one
11 input parameter the program artifact that is the output parameter of the
12 determined program statement; and

13 performing recursively the determination of program statements having as one
14 input parameter one program artifact that is the output parameter of one previously
15 determined program statement having as one input parameter one program statement
16 affected directly or indirectly by the selected source statement.

1 10. The method of claim 5, further comprising:

2 outputting information on determined program statements and program artifacts
3 affected by each selected program statement.

1 11. The method of claim 5, wherein the program artifact comprises a variable,
2 Input/Output buffer or file.

1 12. The method of claim 5, wherein one program statement has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement.

1 13. The method of claim 12, wherein one statement further has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement or if the output parameter program artifact of one statement
5 other than the selected program statement has as one input parameter one program
6 artifact affected by the selected program statement.

1 14. The method of claim 5, wherein if the selected program statement
2 comprises a call to a program routine comprised of a plurality of statements in one of the
3 source code files, then one statement has one input parameter that is affected by the
4 selected program statement if:
5 the output parameter program artifact of the selected source code statement is the
6 input parameter program artifact to the statement; or
7 the input parameter of the selected source code statement is the input parameter
8 program artifact to the statement.

1 15. The method of claim 5, further comprising:
2 accessing the source code files from a control management system.

1 16. A method for performing an impact analysis of program statements in a
2 source code file, wherein each program statement has an input parameter and output
3 parameter, comprising:
4 receiving selection of at least one program statement in the source code file; and
5 for each selected program statement, determining program statements in the
6 source code file having as one input parameter one program artifact that is affected by the
7 selected program statement.

1 17. The method of claim 15, wherein the program artifact comprises a
2 variable, Input/Output buffer or file.

1 18. The method of claim 16, wherein one program statement has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement.

1 19. The method of claim 18, wherein one statement further has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement or if the output parameter program artifact of one statement
5 other than the selected program statement has as one input parameter one program
6 artifact affected by the selected program statement.

1 20. The method of claim 16, wherein selection of a plurality of program
2 statements are received.

1 21. A system for maintaining data on a plurality of source code files,
2 comprising:
3 a computer readable medium;
4 (a) means for generating a data store in the computer readable medium for each
5 source code file and for each program statement in the source code file, by:
6 (i) generating information on the program statement; and
7 (ii) generating information on each program artifact referenced as an input
8 parameter in the program statement;
9 (ii) generating information on each program artifact referenced as an
10 output parameter in the program statement; and
11 (b) means for using the data store to determine program artifacts throughout all of
12 the source code files capable of being affected by any one program statement in any of
13 the source code files.

1 22. The system of claim 21, wherein the means for generating information on
2 the program statements and program artifacts performs:

3 associating each program artifact with one program statement referencing the
4 program artifact as one input or output parameter and information indicating whether the
5 program statement references the program artifact as input or output.

1 23. The system of claim 22, wherein the program artifact comprises a
2 variable, Input/Output buffer or file.

1 24. The system of claim 21, wherein the source code files comprise
2 components of an application program, wherein the data store indicates program artifacts
3 in source code files of application programs.

1 25. A system for performing an impact analysis of program statements in a
2 source code file that is one of a plurality of source code files, wherein each program
3 statement has at least one of an input parameter and output parameter, comprising:
4 means for receiving selection of at least one program statement in one source
5 code file; and

6 means for determining, for each selected program statement, program statements
7 throughout the source code files having as one input parameter one program artifact that
8 is affected by the selected program statement.

1 26. The system of claim 25, wherein the source code files including the
2 program artifacts affected by the selected program statement comprise components of an
3 application program.

1 27. The system of claim 25, wherein the means for determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further performs:

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1 determining program statements in the source code files having as one input
2 parameter the program artifact that is one output parameter to the selected program
3 statement.

1 28. The system of claim 27, wherein the means for determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further performs for each previously determined program statement
4 having as one input parameter one program artifact affected by the selected program
5 statement:

6 determining the output parameter program artifact of the statement; and
7 determining program statements in the source code files having as one input
8 parameter the program artifact that is the output parameter of the previously determined
9 statement.

1 29. The system of claim 28, wherein the means for determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further performs for each previously determined program statement
4 having as one input parameter one program artifact that is the output parameter of one
5 previously determined program statement having as one input parameter one program
6 statement affected directly or indirectly by the selected source program statement:

7 determining the output parameter program artifact of the determined program
8 statement;

9 determining program statements in the source code files having as one
10 input parameter the program artifact that is the output parameter of the determined
11 program statement; and

12 performing recursively the determination of program statements having as one
13 input parameter one program artifact that is the output parameter of one previously
14 determined program statement having as one input parameter one program statement
15 affected directly or indirectly by the selected source statement.

1 30. The system of claim 25, further comprising:
2 means for outputting information on determined program statements and program
3 artifacts affected by each selected program statement.

1 31. The system of claim 25, wherein the program artifact comprises a
2 variable, Input/Output buffer or file.

1 32. The system of claim 25, wherein one program statement has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement.

1 33. The system of claim 32, wherein one statement further has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement or if the output parameter program artifact of one statement
5 other than the selected program statement has as one input parameter one program
6 artifact affected by the selected program statement.

1 34. The system of claim 25, wherein if the selected program statement
2 comprises a call to a program routine comprised of a plurality of statements in one of the
3 source code files, then one statement has one input parameter that is affected by the
4 selected program statement if:

5 the output parameter program artifact of the selected source code statement is the
6 input parameter program artifact to the statement; or

7 the input parameter of the selected source code statement is the input parameter
8 program artifact to the statement.

1 35. The system of claim 25, further comprising:
2 means for accessing the source code files from a control management system.

1 36. A system for performing an impact analysis of program statements in a
2 source code file, wherein each program statement has an input parameter and output
3 parameter, comprising:

4 means for receiving selection of at least one program statement in the source code
5 file; and

6 means for determining, for each selected program statement, program statements
7 in the source code file having as one input parameter one program artifact that is affected
8 by the selected program statement.

1 37. The system of claim 35, wherein the program artifact comprises a
2 variable, Input/Output buffer or file.

1 38. The system of claim 35, wherein one program statement has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement.

1 39. The system of claim 38, wherein one statement further has one input
2 parameter that is affected by the selected program statement if the output parameter
3 program artifact of the selected program statement is the input parameter program artifact
4 to the program statement or if the output parameter program artifact of one statement
5 other than the selected program statement has as one input parameter one program
6 artifact affected by the selected program statement.

1 40. The system of claim 36, wherein selection of a plurality of program
2 statements are received.

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1 41. An article of manufacture including code for maintaining data on a
2 plurality of source code files by:
3 (a) generating a data store for each source code file and for each program
4 statement in the source code file by:
5 (i) generating information on the program statement; and
6 (ii) generating information on each program artifact referenced as an input
7 parameter in the program statement;
8 (ii) generating information on each program artifact referenced as an
9 output parameter in the program statement; and
10 (b) using the data store to determine program artifacts throughout all of the source
11 code files capable of being affected by any one program statement in any of the source
12 code files.

1 42. The article of manufacture of claim 41, wherein the source code files
2 comprise components of an application program, wherein the data store indicates
3 program artifacts in source code files of application programs.

1 43. The article of manufacture of claim 41, wherein generating information on
2 the program statements and program artifacts comprises:
3 associating each program artifact with one program statement referencing the
4 program artifact as one input or output parameter and information indicating whether the
5 program statement references the program artifact as input or output.

1 44. The article of manufacture of claim 43, wherein the program artifact
2 comprises a variable, Input/Output buffer or file.

1 45. An article of manufacture including code for performing an impact
2 analysis of program statements in a source code file that is one of a plurality of source

1 code files, wherein each program statement has at least one of an input parameter and
2 output parameter, by:
3 receiving selection of at least one program statement in one source code file; and
4 for each selected program statement, determining program statements throughout
5 the source code files having as one input parameter one program artifact that is affected
6 by the selected program statement.

1 46. The article of manufacture of claim 45, wherein the source code files
2 including the program artifacts affected by the selected program statement comprise
3 components of an application program.

1 47. The article of manufacture of claim 45, wherein determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further comprises:
4 determining program statements in the source code files having as one input
5 parameter the program artifact that is one output parameter to the selected program
6 statement.

1 48. The article of manufacture of claim 47, wherein determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further comprises:
4 for each previously determined program statement having as one input parameter
5 one program artifact affected by the selected program statement, performing the steps of:
6 (i) determining the output parameter program artifact of the statement; and
7 (ii) determining program statements in the source code files having as one
8 input parameter the program artifact that is the output parameter of the previously
9 determined statement.

1 49. The article of manufacture of claim 48, wherein determining the program
2 statements having as one input parameter one program artifact affected by the selected
3 program statement further comprises:

4 for each previously determined program statement having as one input parameter
5 one program artifact that is the output parameter of one previously determined program
6 statement having as one input parameter one program statement affected directly or
7 indirectly by the selected source program statement, performing the steps of:

8 (i) determining the output parameter program artifact of the determined
9 program statement;

10 (ii) determining all program statements in the source code files having as
11 one input parameter the program artifact that is the output parameter of the
12 determined program statement; and

13 performing recursively the determination of program statements having as one
14 input parameter one program artifact that is the output parameter of one previously
15 determined program statement having as one input parameter one program statement
16 affected directly or indirectly by the selected source statement.

1 50. The article of manufacture of claim 45, further comprising:
2 outputting information on determined program statements and program artifacts
3 affected by each selected program statement.

1 51. The article of manufacture of claim 45, wherein the program artifact
2 comprises a variable, Input/Output buffer or file.

1 52. The article of manufacture of claim 45, wherein one program statement
2 has one input parameter that is affected by the selected program statement if the output
3 parameter program artifact of the selected program statement is the input parameter
4 program artifact to the program statement.

1 53. The article of manufacture of claim 52, wherein one statement further has
2 one input parameter that is affected by the selected program statement if the output
3 parameter program artifact of the selected program statement is the input parameter
4 program artifact to the program statement or if the output parameter program artifact of
5 one statement other than the selected program statement has as one input parameter one
6 program artifact affected by the selected program statement.

1 54. The article of manufacture of claim 45, wherein if the selected program
2 statement comprises a call to a program routine comprised of a plurality of statements in
3 one of the source code files, then one statement has one input parameter that is affected
4 by the selected program statement if:
5 the output parameter program artifact of the selected source code statement is the
6 input parameter program artifact to the statement; or
7 the input parameter of the selected source code statement is the input parameter
8 program artifact to the statement.

1 55. The article of manufacture of claim 45, further comprising:
2 accessing the source code files from a control management system.

1 56. An article of manufacture for performing an impact analysis of program
2 statements in a source code file, wherein each program statement has an input parameter
3 and output parameter, by:
4 receiving selection of at least one program statement in the source code file; and
5 for each selected program statement, determining program statements in the
6 source code file having as one input parameter one program artifact that is affected by the
7 selected program statement.

1 57. The article of manufacture of claim 56, wherein the program artifact
2 comprises a variable, Input/Output buffer or file.

1 58. The article of manufacture of claim 56, wherein one program statement
2 has one input parameter that is affected by the selected program statement if the output
3 parameter program artifact of the selected program statement is the input parameter
4 program artifact to the program statement.

1 59. The article of manufacture of claim 58, wherein one statement further has
2 one input parameter that is affected by the selected program statement if the output
3 parameter program artifact of the selected program statement is the input parameter
4 program artifact to the program statement or if the output parameter program artifact of
5 one statement other than the selected program statement has as one input parameter one
6 program artifact affected by the selected program statement.

1 60. The article of manufacture of claim 56, wherein selection of a plurality of
2 program statements are received.